

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/017961

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ A61K31/5575, 31/427, 31/559, 31/429, A61P9/00, 13/10, 15/10, 25/00, 29/00, 43/00, C07D277/56, 515/18, 417/12, C07C405/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ A61K31/5575, 31/427, 31/559, 31/429, A61P9/00, 13/10, 15/10, 25/00, 29/00, 43/00, C07D277/56, 515/18, 417/12, C07C405/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CAPLUS (STN), CAOLD (STN), REGISTRY (STN), MEDLINE (STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 11-130678 A (Kaken Pharmaceutical Co., Ltd.), 18 May, 1999 (18.05.99), Page 3 (Family: none)	1-3, 8 1-6
X Y	LIU, Y., "Rat Umao Shinkei Appaku Hoko Shogai Model Deno Beraprost Natrium to Limaprostal fadex Tono Hikaku", Basic Pharmacology & Therapeutics, (2002), Vol.30, No.10, pages 875 to 880	1-3, 8 1-6
A	KIRIYAMA, M., "Ligand binding specificities of the eight types and subtypes of the mouse prostanoïd receptors expressed in Chinese hamster ovary cells.", Br.J.Pharmacol., (1997), Vol.122, No.2, pages 217 to 224	2

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search
17 January, 2005 (17.01.05)

Date of mailing of the international search report
01 February, 2005 (01.02.05)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 03/009872 A1 (ONO PHARMACEUTICAL CO., LTD.), 06 February, 2003 (06.02.03), Pages 272, 371, 387, 390 to 392, 401 to 403, 405 to 409 & EP 1417975 A1 & BR 2002011364 A	9 1-6, 8
X Y	WO 03/074483 A1 (ONO PHARMACEUTICAL CO., LTD.), 12 September, 2003 (12.09.03), Pages 47, 67, 87, 107 & EP 1481976 A1	9, 10 1-6, 8
X Y	EP 156611 A2 (ONO PHARMACEUTICAL CO., LTD.), 02 October, 1985 (02.10.85), Page 34 & JP 60-197667 A & DK 8501220 A & HU 200173 B & US 4622410 A & CA 1250285 A1	11 1-6, 8
X Y	KUWADA, H., "Effects of prostaglandin derivatives on changes of gastric mucosal protein contents in ethanol-induced ulcer", Cyto-protection & Biology, (1985), Vol.3, pages 217 to 225	11 1-6, 8
X	Kiyohiro TSUTSUI, "Procylin Naifuku Toyo ga Soko Shita Livedo Kekkan'en no 1 Rei", The Journal of Medicine, (1994), Vol.32, No.3, pages 611 to 613	6
P, X	WO 2004/065365 A1 (ONO PHARMACEUTICAL CO., LTD.), 05 August, 2004 (05.08.04)	1-6, 8-11

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 7

because they relate to subject matter not required to be searched by this Authority, namely:

Claim 7 pertains to methods for treatment of the human body by therapy and thus relates to a subject matter which this International Searching Authority is not required, under the provisions of Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.

2. ☐ Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet (observations where unity of invention is lacking).

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

Continuation of Box No. III of continuation of first sheet (2)
<Observations where unity of invention is lacking>

Claims 1 to 5 and 8 relate to a blood flow promoter for cauda equina tissues comprising a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost).

Claim 6 relates to a drug comprising a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost) combined with another chemical.

The matter common to claims 1 to 5 and 8 and claim 6 resides in being a drug comprising a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost). However, it is not novel without a need for citing documents and, therefore, this common matter cannot be considered as a special technical feature.

Claims 4 and 5 relate to a blood flow promoter for cauda equina tissues comprising a compound represented by the general formula (I) as the active ingredient, while the inventions according to claims 9 to 11 relate to compounds represented by the general formula (I). However, a compound having the fundamental skeleton of these compounds is publicly known as reported by document (WO 03/009872 A1 (Ono Pharmaceutical Co., Ltd.) 06 February, 2003 (06.02.03)), etc. Thus, it cannot be concluded that claims 4 and 5, claim 9, claim 10 and claim 11 have a novel fundamental skeleton in chemical structures in common.

Since there is no matter being common to all claims and seemingly being a special technical feature, the present application has five groups of inventions.

<Subject of search>

Claims 1 to 3 and 8 relate to a blood flow promoter for cauda equina tissues comprising a compound defined by a desired property "a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost)" or "an EP2 and/or EP3 agonist".

Although the compound as set forth in claims 1 to 3 and 8 involves any compounds having such properties, only small part of the claimed compounds are specifically disclosed in the description. Thus, it is recognized that these claims are not supported by the disclosure in the description.

Although the common technical knowledge at the point of the application is taken into consideration, the scope of the compound having the property as "a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost)" or "an EP2 and/or EP3 agonist" cannot be specified. Thus, claims 1 to 3 and 8 do not comply with the requirement of clearness too.

The active ingredient of the medicinal composition according to the invention as set forth in claim 4 involves various compounds over a wide range and it is highly difficult to completely examine each of them. On the other hand, only small part of the active ingredients of the medicinal composition according to the invention as set forth in claim 4 are disclosed in the description in the meaning within Patent Cooperation Treaty Article 5.

Claim 6 relates to a medicine comprising "a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost)" combined with another drug. However, no specific combination is disclosed in the description and, therefore, it appears that claim 6 is not supported by the disclosure in the description.

Although the common technical knowledge at the point of the application is taken into consideration, the scope of "a prostaglandin-like compound having a weak hypotensive effect (excluding limaprost)" cannot be specified. Thus, claim 6 does not comply with the requirement of clearness too.

Such being the case, claims 1 to 4, 6 and 8 and the description do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out.

The inventions according to claims 5 and 9 to 11 relate to compounds represented by the general formula (I), medicines comprising the same as the active ingredient, and so on. However, a compound having the fundamental skeleton of these compounds is publicly known as reported by document (WO 03/009872 A1 (Ono Pharmaceutical Co., Ltd.) 06 February, 2003 (06.02.03)), etc. Thus, it cannot be concluded that the compounds according to the present invention have a novel fundamental skeleton in chemical structures in common. Such being the case, it is impossible to clearly understand a single invention based on the above claims declaring these compounds.

Although attempts were made to search prior art documents by reference to the contents of the description of the present case, a large number of compounds corresponding to the invention compounds were found out in the course of the search. Moreover, the claims have expressions "may be substituted", "a prodrug", etc. whereby the extent of the structures of compounds falling within the scope are made unclear. Thus, it is impossible in practice to search in detail and present all documents reporting these compounds.

(continued to the next sheet)

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The invention according to claim 5 is an invention of medicinal use and so on. However, the compounds presented as compounds 8-1 and compound 53 are exclusively supported by the description and disclosed therein.

Thus, claims 5 and 9 to 11 and the description do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out.

Such being the case, the search was made based on the compounds specifically presented in the description within the range of reasonable burden in this international search.